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AIRLINE CAPITAL REQUIREMENTS IN THE 1980'S

$90 billion by '90

ata Air Transport Association of America

AIRLINE CAPITAL REQUIREMENTS IN THE 1980'S

CONTENTS

Summary 1
Determining Capital Requirements 1
Possible Constraints on Airline Expansion 3
1979 Versus 1989 3
Meeting Future Capital Requirements 4
Competition for Investment Funds 5
Applications and Sources of Funds 6
Conclusion 6
Technical Appendix i

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Summary

The U.S. economy is undergoing marked changes. The economic growth rate of the nation is slowing down while inflation continues to increase without any sign of abatement. In addition, the fuel shortage, with its resultant price rise, has become a grave national concern. Yet, at the same time, the airlines have moved into a less regulated environment, new discount fares have been introduced, load factors have been increased, and industry profits have risen to a record $1.2 billion. Such sweeping changes demand a new appraisal of future airline developments and capital investment.[1]

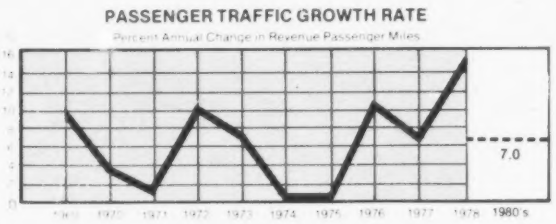
The latest ATA research shows that the U.S. scheduled airline industry will need an average annual Corporate Return on Investment (ROI) of 13-15 per cent to meet a $90 billion capital requirement between 1979 and 1990. This major capital investment program consists of: $80 billion for additional passenger aircraft to be delivered in the 1980's; $7 billion for freighter aircraft; and $3 billion for passenger aircraft to be delivered in 1979. To support such an enormous financial need, the airlines must maintain a record of consistently adequate profit levels. It is the only means for generating the necessary internal funds and attracting outside capital.

Determining Capital Requirements

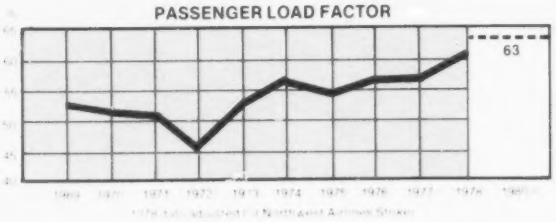
Two primary characteristics determine the essential capital investment in the airline industry: traffic growth and aircraft replacement. Also, other areas such as passenger load factors, aircraft utilization rates and average seating densities affect overall capital requirements. Therefore, each of these factors has to be evaluated and fundamental assumptions developed.

In estimating future airline capital requirements, the following assumptions were used for the 1980's:

- *Annual passenger traffic growth rate of 7 percent*
  In the past three full years, 1976 through 1978, annual passenger traffic growth has averaged 11 per cent. During the first six months of 1979, this high growth rate has continued, with the average annual growth rate being 15.6 per cent.

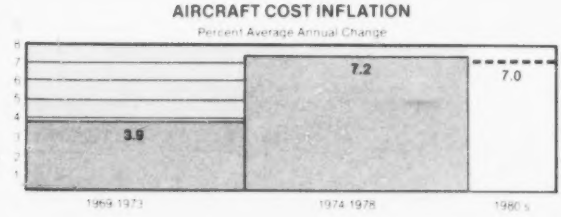


- *Passenger load factor of 63 per cent*
  Prior to 1974, the annual load factor generally fluctuated between 50 and 55 per cent. During the period 1974 to 1977 this range moved to between 55 and 60 per cent. In 1978, for the first time in the ten-year period, the annual load factor exceeded 60 per cent, finally reaching 61 per cent for the year. While the 63 per cent long term load factor assumed in the study is higher than has been attained in a single year throughout the past ten-year period, continued public acceptance of the new and varied discount fares will necessitate future load factors above 60 per cent. Such a load factor on a year-round system basis means that peak period flights will be consistently booked to the maximum and public service will be affected accordingly.

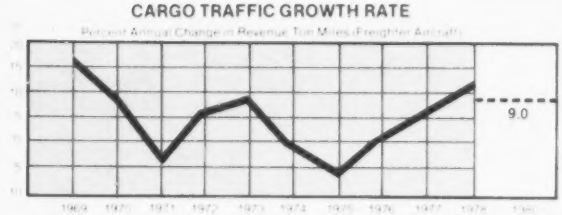


[1]In 1976 the Air Transport Association published "The Sixty Billion Dollar Question"—a study of the long term capital investment requirements for the airline industry. A comparison of the 1976 and 1979 studies is contained in the technical appendix.

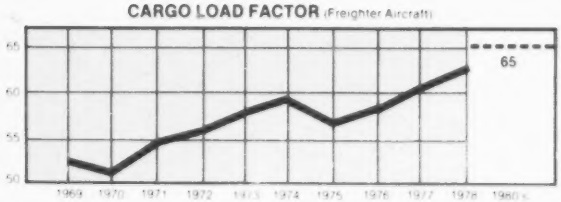
- *Aircraft utilization rate of 9.5 hours per day*
  Aircraft utilization increased from 8.3 hours per day in 1975 to 9 hours in 1978 due in part to better scheduling and increased cost pressures. The Deregulation Act of 1978 permits carriers to acquire routes which augment their hub-and-spoke networks, thus increasing utilization. Therefore, some further increases can be assumed.



- *Annual aircraft cost inflation rate of 7 per cent*
  While the cost per seat for new aircraft increased 3.9 per cent per year during the five-year period from 1969 through 1973, it increased 7.2 per cent per year from 1974 through 1978. Current estimates of U.S. inflation indicate that this rate will not drop below 7 per cent per year in the 1980's.



- *Annual cargo traffic growth rate (Freighter Aircraft) of 9 per cent*
  Although averaging only 5.8 per cent during the past three years, cargo traffic growth has accelerated rapidly, especially with the impetus of deregulation.



- *Cargo load factor for freighter aircraft of 65 per cent*
  Load factors for cargo aircraft have risen steadily over the past decade reaching a high of nearly 63 per cent in 1978.

- *Increase in the average seating density of 2 per cent*
  Airlines have continually made cabin configuration changes in recent years to achieve higher seating density. Most wide-bodied aircraft now provide ten abreast seating in 747's instead of nine, and nine abreast instead of eight in DC-10's and L1011's. Airlines are approaching maximum seating density. Nevertheless, allowance has been made for a moderate 2 percent increase from 1979 through 1989.

SUMMARY OF CAPITAL REQUIREMENTS
For Alternate Assumptions
1979-1989

ASSUMPTIONS	BASE STUDY	ALTERNATE ASSUMPTIONS									
ANNUAL GROWTH RATE PASSENGER RPMS	7%	5%	9%								
CARGO RTMS	9%	7%	11%								
LOAD FACTOR PASSENGER A/C	63%			61%	65%						
CARGO A/C	65%			63%	67%						
AIRCRAFT SERVICE LIFE PASSENGER	18 YR					16 YR	20 YR				
CARGO	18 YR					16 YR	20 YR				
INFLATION RATE PASSENGER A/C	7%							6%	8%		
CARGO A/C	7%							6%	8%		
UTILIZATION PASSENGER A/C	9.5									9HR/DAY	10 HR/DAY
CARGO A/C	HR/DAY									9HR/DAY	10 HR/DAY
SEATING DENSITY PASSENGER A/C	+ 2%									+ 2%	+ 2%
CAPITAL REQUIREMENTS (BILLIONS)	$90	$70	$113	$89	$87	$86	$82	$83	$86	$85	$83

FIGURE 1

It is clear that changes in the values of these assumptions would alter the final figure for capital requirements. But Figure 1 shows that such variations do not change the order of magnitude of capital requirements needed from 1979 through 1989. Overall, variations in the assumptions provide a range of investment from $70 billion to $113 billion.

Possible Constraints on Airline Expansion

When considering growth assumptions, it must be recognized that several factors could potentially restrict the growth of the airline industry in the 1980's. These factors, which involve handling 225 million more passengers in 1990 than today, include airport and airway capacity to accommodate these additional people and the availability of fuel to move the aircraft carrying them. While a true understanding of these factors would require a detailed examination, certain relevant observations should be made.

Since the average size of the new aircraft will be larger, the number of aircraft in 1989 may not be significantly greater than the number in the present fleet. Primarily because of the replacement of narrow-bodied aircraft with wide-bodied aircraft, it has been estimated that average seats per aircraft will increase by as much as 40 per cent by 1990. This would allow a fleet of relatively the same size as the current fleet to carry 1990 passenger volumes that in today's fleet would require over 1,000 additional aircraft. However, to accommodate this passenger growth, terminal capacity must be nearly doubled during the next eleven years.

The rising cost and short supply of fuel has adversely affected the airline industry, as it has many other industries and the nation as a whole. Through the utilization of new aircraft, greater fuel economy, and higher load factors, the airlines have increased overall fuel efficiency. Yet, the availability and cost of fuel remain serious problems confronting the industry.

1979 Versus 1989

By 1990 the U.S. airline industry will require at least $90 billion in capital funds to meet its present and future responsibilities. How did such a large capital requirement come about? Essentially, because the magnitude of changes in costs and capacity that will take place between 1979 and 1989 is enormous. Of the $3 billion that will be spent for equipment in 1979, the average cost for each seat added, including associated spare parts, engines, ground property and equipment, will be $114,000. By 1989, the average cost per seat will increase to over $210,000. In addition, the airlines will need to increase the number of these seats to meet the rise in passenger traffic. The additional available seat miles (ASMs), the measure of airline capacity, will be 74 billion in 1989 as compared to 32 billion in 1979. Thus, the necessary annual capital additions will increase fourfold from the $3 billion needed in 1979 to $12 billion in 1989 as demonstrated in Figure 2.

Measures of Change in Capital Needs
Passenger Aircraft
1979 versus 1989

	1979	1989
Average Cost per Seat ($)	114,100	210,600
Annual ASM's Added (billions)	31.9	74.4
Annual Capital Additions ($ billions)	2.8	12.2

FIGURE 2

The amount of capital to be invested by the airline industry in the 1980's is not comparable to any past period. Figure 3 illustrates previous capital requirements grouped in five-year periods and compares those with the capital requirements in the 1980's. In the five-year period 1960-1964, when jet aircraft were replacing piston aircraft, total capital additions amounted to $3 billion. Capital additions rose to $7 billion during 1965 through 1969, and $9 billion during 1975 through 1979, including the $3 billion for aircraft on order for 1979. In the next five years, a requirement double the amount spent during the past five years—$22 billion—will be needed. However, the last five years of the decade, 1985

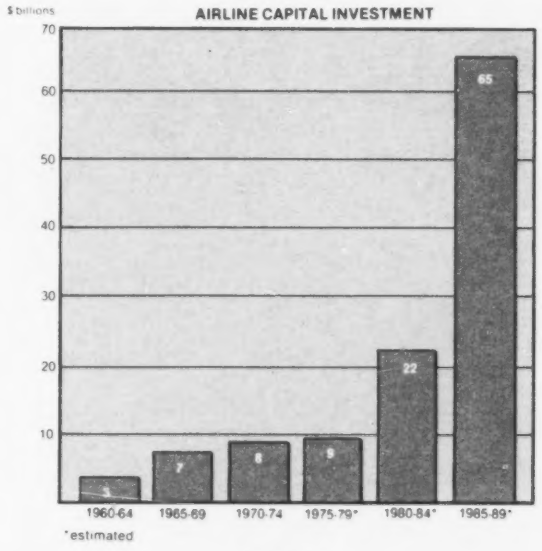


FIGURE 3

through 1989, will be marked by a $65 billion airline capital investment. In that period alone, the airline capital investment will substantially exceed the total requirement over the previous 25 years.

Because of long lead times required for aircraft orders, some aircraft have already been ordered to meet the requirements for growth and replacement in the 1980's. Lead times are particularly long in the present time period because newer technology aircraft are yet to go from drawing board to production.

How close do current orders match the capacity requirements of the 1980's? Figure 4 compares the capital requirements for that ten year period with the investment for aircraft capacity on order as of June, 1979. Between 1980 and 1984, an additional $22 billion in investment will be needed. Only $8.6 billion, less than 40 per cent of the total requirement for this period, is now on order. In the last half of the decade, $65 billion of new equipment will be required. Current orders total less than $400 million to be delivered against that need. Additional orders will be placed in the future, of course, but current orders only account for approximately 10 per cent of the capacity requirements of the 1980's.

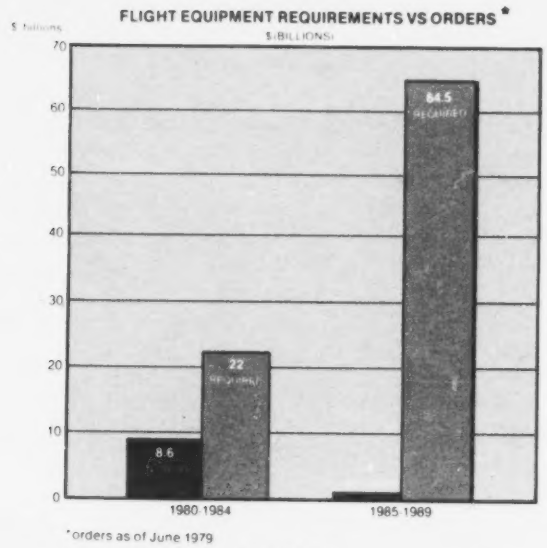


FIGURE 4

In this study an aircraft's useful life was assumed to be 18 years. Under this assumption, it is striking to note that in the 1980-1984 period, the requirement to meet new traffic growth predominates. However, during the interval 1985 through 1989, the replacement factor plays a more prominent role. This shift reflects the need to replace the large numbers of jet aircraft purchased eighteen years earlier, 1967 through 1971. Of the total capital requirement of $90 billion, Figure 5 reveals that $37 billion is for the replacement of aircraft as they reach the end of their service lives.

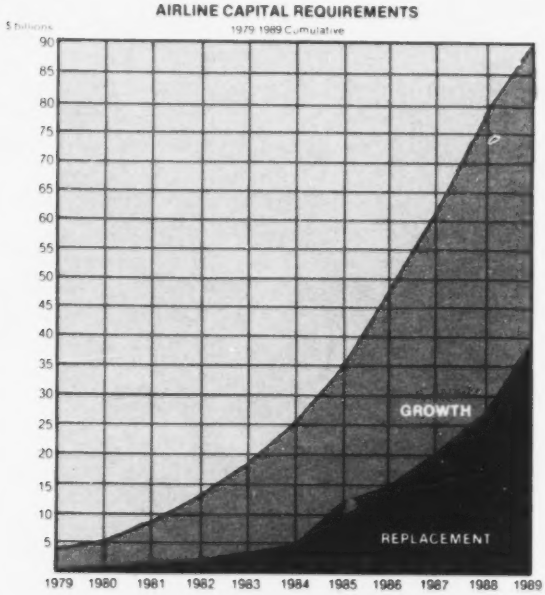


FIGURE 5

Meeting Future Capital Requirements

The early years of prosperous jet operations, beginning in the early 1960's, provided sufficient internal cash flow to finance the continuing replacement of piston aircraft, as well as substantial industry expansion. During this period airlines were able to acquire additional long-term debt and equity capital at relatively reasonable terms.

Beginning in 1967, however, total capital investment began to exceed internally generated funds. By 1970, this disparity grew significantly and, until recently, capital investment has consistently exceeded the industry's internally generated funds. Much of this divergence was temporarily overcome through special long-term financing and leasing arrangements.

To examine various ways in which the airlines can meet the estimated $90 billion capital requirement in the 1980's, several assumptions were made about the industry's financial structure including:

1. The airlines will pay 25 per cent of their net income in stockholders' dividends. Figure 6 shows that U.S. industry paid an average of 44.7 per cent of net income in dividends from 1969 through 1978. Airlines have paid only 26.8 per cent during the same period.

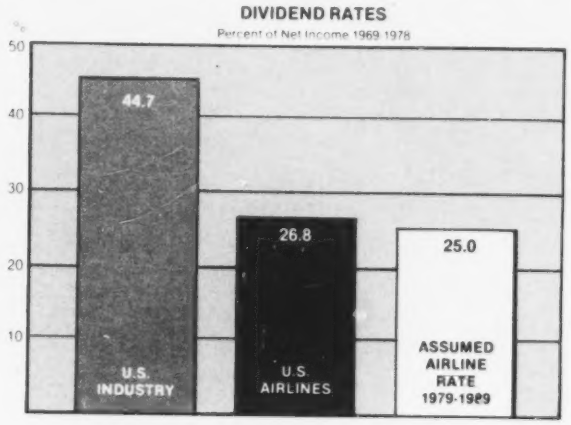


FIGURE 6

2. The level of long-term debt will not rise much above 50 per cent of total capital—a one-to-one debt/equity ratio.
3. The historical levels of working capital, with respect to operating expenses, will be maintained.

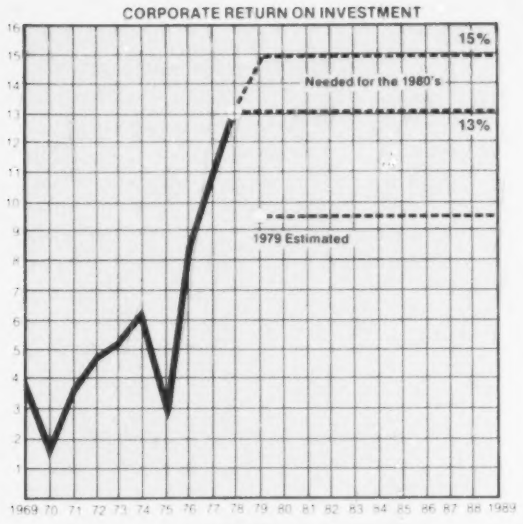


FIGURE 7

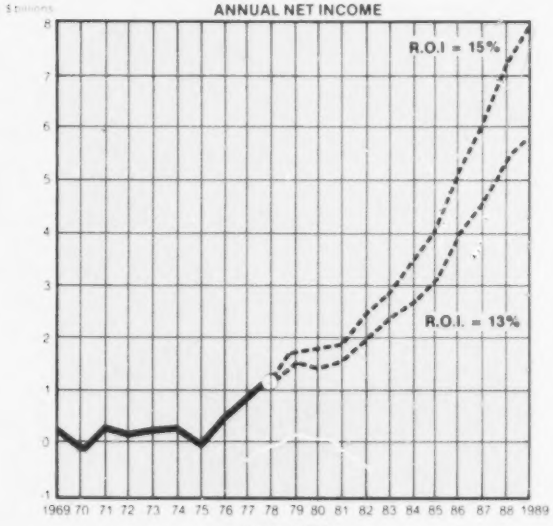


FIGURE 8

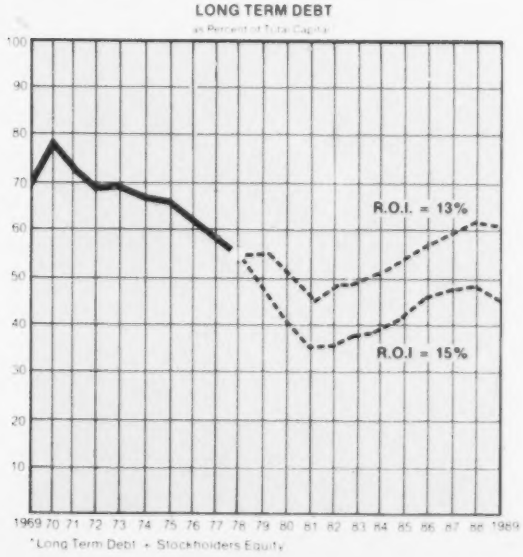

LONG TERM DEBT
as Percent of Total Capital
R.O.I. = 13%
R.O.I = 15%
1969 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 1989
*Long Term Debt + Stockholders Equity

FIGURE 9

Using these assumptions, Figures 7 through 9 show that a corporate return on investment[2] between 13 per cent and 15 per cent will be necessary to meet the $90 billion requirement.

Figure 7 contrasts profitability levels of the past ten years with that needed in the 1980's. From 1969 through 1975, the airline industry's corporate ROI averaged about 3.8 per cent. Beginning in 1976 it began to climb: 8 per cent in 1976; 10.9 per cent in 1977; and 13 per cent in 1978—the year in which the airlines earned a record $1.2 billion. Even then, 13 per cent is the minimal level necessary for the coming years of investment in the 1980's. Corporate ROI for 1979 is currently estimated at 9.6 per cent—well short of the minimal requirement.

Figure 8 shows that ROI's between 13 per cent and 15 per cent would generate steadily rising net incomes ranging between $5.8 billion and $7.8 billion by 1989.

Figure 9 shows that in 1970 long-term debt represented more than 75 per cent of capital. However, this ratio has declined steadily during the past decade, indicating that the industry has taken advantage of recent higher earnings to favorably restructure balance sheets. A 13 to 15 per cent ROI would provide continued improvement in the debt/equity ratio during the early years of the 1980's and produce debt to total capital ratios near the 50 per cent level in the later years of the decade.

Competition for Investment Funds

The airlines' low earnings history until quite recently meant that small profits reduced the supply of internal funds for needed growth and prevented the airlines from attracting favorable interest rates from prime lenders. Airlines were forced to pay more for borrowed capital and thus increased indebtedness which contributed to lower earnings. This is evident from Figure 10 which contrasts airlines' annual ROI with that of U.S. non-financial corporations. U.S. non-financial corporations have increased their ROI from about 10 per cent in 1969 to a little more than 12 per cent in 1978. The airlines did not enter this range until 1978.

As indicated earlier, the industry reached and even exceeded the average return on investment for all U.S. non-financial corporations in 1978, but estimates for 1979 are for 9.6 per cent—well below the 12.4 per cent estimated for all U.S. non-financial corporations.

With the present shortage of capital and the forecast by non-financial industries that their capital requirements for the 1980's will be 300 per cent greater than today, it is obvious there will be an intense competition for investment funds. In capital market competition, long-term profitability is a vital factor.

[2]The rate of return on investment used as the measure of profitability, is defined as:

$$\frac{\text{Net Income + Interest on Long Term Debt}}{\text{Long Term Debt + Stockholder's Equity}}$$

A detailed discussion of the corporate ROI and the CAB ratemaking ROI, which was used in the 1976 study, is presented in the technical appendix.

FIGURE 10

Applications and Sources of Funds

In addition to a capital requirement of $90 billion, the airlines have other significant demands on their funds. Debt service and repayment will require an additional $19 billion in the 80's. Another $11 billion will go for stockholders' dividends if the rate of 25 per cent of net income is to be maintained. And about $2 billion will be needed for additional working capital. Thus, the total funds needed from 1979 through 1989 will amount to $122 billion. (Figure 11)

What will be the source of this $122 billion? Net income, at the 15 per cent ROI level, would provide $45 billion. Funds allocated for replacement of equipment—depreciation—would yield another $34 billion. But the remaining $43 billion must be secured through new debt or new equity. The ATA study assumed that these funds would come from new debt, since the debt ratio at this level of profitability would not result in an excessively high debt/equity ratio. This, of course, does not preclude the possibility of carriers seeking and receiving equity financing in the future and, indeed, some are doing so now. (Figure 12)

Applications and Sources of Funds
15% Corporate ROI (Cumulative 1979-1989)

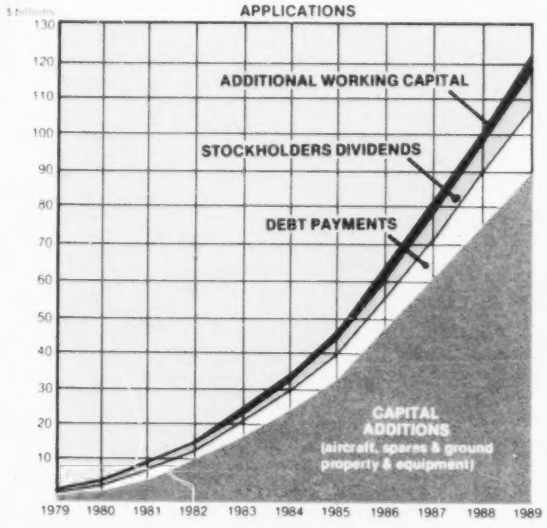


FIGURE 11

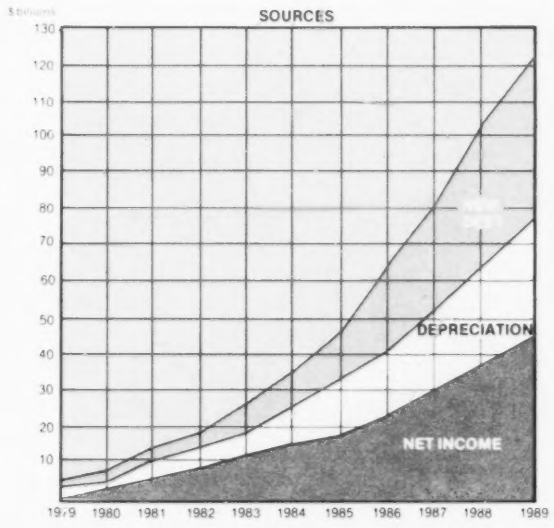


FIGURE 12

Conclusion

Though the decade of the 1980's, the airline industry should invest $90 billion to continue the high level of transport services provided in the past. In order to generate the necessary cash flow and attract outside capital, the airlines must exhibit consistent and sufficient earnings, an ROI of 13 to 15 per cent over an extended period of time. Since the possibility of large productivity gains are limited, the challenge to the airlines is considerable. Still, the airline industry has historically met such challenges and undoubtedly will continue to do so in the future.

TECHNICAL APPENDIX

CONTENTS

Capital Requirements Data and Description ii

Financing Requirements Data and Description at 13 per cent and 15 per cent ROI vi

Comparison of 1976 Study and Current Study x

Corporate ROI vs. CAB Ratemaking ROI xi

Capital Requirements Data and Description

An example computer print-out of results of the capital requirements analysis used in this study is reproduced on Page iv, preceded by a complete description of each of the columns.

The example incorporates the following basic assumptions:

Traffic Growth:	
Passenger RPMs	7%
Cargo RTMs	9%
Load Factor:	
Passenger	63%
Cargo	65%
Aircraft Service Life	18 years
Aircraft Annual Inflation Rate	7%
Aircraft Utilization	9.5 Block Hours per day
Aircraft Seating Density	2% over 1978 seating

Similar analyses were made for other sets of assumptions described in the report.

Description

TOTAL AIRCRAFT CAPITAL REQUIREMENT FORECAST

Column Heading	Description
YEAR	Year of Forecast
ANNUAL CAPITAL REQUIREMENTS	
A/C	Annual cost of new passenger and freighter aircraft and spare engines in millions of current dollars
GP&E	Annual cost of new ground property and equipment and spare parts associated with new aircraft acquisitions amounting to 20% of new aircraft cost.
TOTAL	Total annual capital requirements. Sum of A/C and GP&E.
CUMULATIVE CAPITAL REQUIREMENTS	
REPLACE	Cumulative capital requirements for equipment replacement (aircraft, spare engines, ground property and equipment and spare parts) for aircraft phased out after 18-year service life.
GROWTH	Cumulative capital requirements for new equipment to meet growth needs.
TOTAL	Total cumulative capital requirements. Sum of columns REPLACE and GROWTH.

PASSENGER (FREIGHTER) AIRCRAFT CAPITAL REQUIREMENTS CAPACITY

YEAR	Year of Forecast
RPM'S (RTM'S)	Annual system revenue passenger miles (revenue ton miles) of U.S. scheduled airlines at forecast growth rate.
LOAD FACTOR	Passenger (Cargo) load factor
ASM'S (ATM'S)REQUIRED	Fleet capacity required to accommodate traffic at forecast load factor; RPM'S (RTM'S) divided by LOAD FACTOR.
CURRENT FLEET ASM'S (ATM'S)	Capacity of fleet after phase-out of aircraft in existing fleet at specified service life (18 years) with no change in current or future aircraft utilization or seating.
ADDITIONAL ASM'S (ATM'S) REQUIRED	
REPLACE	Additional capacity required to replace phased-out aircraft. Previous year minus current year CURRENT FLEET ASM'S (ATM'S).
GROWTH	Additional capacity required for traffic growth. ASM'S (ATM'S) REQUIRED minus CURRENT FLEET ASM'S (ATM'S) minus REPLACE.
TOTAL	Total additional capacity required for both growth and replacement. ASM'S (ATM'S) REQUIRED minus CURRENT FLEET ASM'S (ATM'S).
UTILIZATION AND SEAT ADJUSTMENT ADJ. CURRENT FLEET	
ASM'S (ATM'S)	Current fleet capacity adjusted to reflect utilization and seating density changes; CURRENT FLEET ASM'S (ATM'S) times percent change in utilization and seating density.
ASM (ATM) GAIN	Annual gain in capacity from utilization and seating density changes. CURRENT FLEET ASM'S (ATM'S) minus ADJ. CURRENT FLEET ASM'S (ATM'S).
ADJ. ADDITIONAL ASM'S (ATM'S)REQUIRED	
REPLACE	Additional capacity required to replace phased-out aircraft adjusted for utilization and seating density changes. REPLACE divided by TOTAL ADDITIONAL ASM'S (ATM'S) REQUIRED times ADJ. ADDITIONAL ASM'S (ATM'S) REQUIRED --TOTAL.
GROWTH	Additional capacity required for traffic growth adjusted for utilization and seating density changes. ASM'S (ATM'S) REQUIRED minus ADJ. CURRENT FLEET ASM'S (ATM'S) minus ADJ. ADDITIONAL ASM'S (ATM'S) REQUIRED -- REPLACE.
TOTAL	Total additional capacity required for both growth and replacement adjusted for utilization and seating density changes. ASM'S (ATM'S) REQUIRED minus ADJ. CURRENT FLEET ASM'S (ATM'S).
ANNUAL ADDITIONAL ASM'S (ATM'S) REQUIRED	Annual change in ADJ. ADDITIONAL ASM'S (ATM'S) REQUIRED -- TOTAL
A/C COST PER ASM (ATM)	Cost per ASM (ATM) of equipment purchased in 1978 at assumed inflation rate.
Note:	The remaining columns are computed as described above in TOTAL AIRCRAFT CAPITAL REQUIREMENT FORECAST.

Data

TOTAL AIRCRAFT CAPITAL REQUIREMENTS FORECAST
(DATA IN MILLIONS)

YEAR	ANNUAL CAPITAL REQUIREMENTS AIC	GP+E	TOTAL	CUMULATIVE CAPITAL REQUIREMENTS REPLACE	GROWTH	TOTAL
1978						
1979	2,489	498	2,987	32	2,955	2,987
1980	1,688	338	2,026	379	4,633	5,013
1981	1,805	361	2,166	567	6,611	7,178
1982	4,369	874	5,243	1,814	10,607	12,421
1983	4,779	956	5,735	3,086	15,070	18,156
1984	5,688	1,138	6,826	4,789	20,193	24,982
1985	7,578	1,506	9,033	7,752	26,263	34,015
1986	10,981	2,196	13,177	13,548	33,644	47,192
1987	10,906	2,181	13,087	18,697	41,583	60,280
1988	12,998	2,600	15,598	25,154	50,774	75,878
1989	11,371	2,274	13,646	29,108	60,415	89,523

PASSENGER AIRCRAFT CAPITAL REQUIREMENTS
CAPACITY
(DATA IN MILLIONS EXCEPT WHERE *)

YEAR	RPM'S	* LOAD FACTOR	ASM'S REQUIRED	CURRENT FLEET ASM'S	ADDITIONAL ASM'S REQUIRED REPLACE	GROWTH	TOTAL	UTILIZATION AND SEAT ADJUSTMENT ADJ. CURRENT FLEET ASM'S	ASM GAIN	ADJ. ADDITIONAL ASM'S REQUIRED REPLACE	GROWTH	TOTAL
1978	236,865	62.0	382,040	382,922				382,922				
1979	260,551	62.3	418,221	382,522	400	35,299	35,699	386,347	3,825	357	31,516	31,873
1980	278,790	63.0	442,524	377,632	5,290	59,602	64,892	390,849	13,217	4,213	47,462	51,675
1981	298,305	63.0	473,501	376,354	6,568	90,579	97,147	403,075	26,721	4,761	65,664	70,426
1982	319,187	63.0	506,646	366,105	16,817	123,724	140,541	392,098	25,993	13,707	100,841	114,547
1983	341,530	63.0	542,111	354,362	28,560	159,189	187,749	379,522	25,160	24,733	137,856	162,589
1984	365,437	63.0	580,059	339,837	43,085	197,137	240,222	363,965	24,128	38,757	177,336	216,093
1985	391,018	63.0	620,663	315,552	67,370	237,741	305,111	337,956	22,404	62,423	220,284	282,707
1986	418,389	63.0	664,109	269,959	112,963	281,187	394,150	289,176	19,167	107,470	267,513	374,983
1987	447,676	63.0	710,597	232,608	150,314	327,675	477,989	249,173	16,515	145,120	316,353	461,474
1988	479,013	63.0	760,339	189,533	193,389	377,417	570,806	202,990	13,457	188,830	368,519	557,349
1989	512,544	63.0	813,562	169,726	213,196	430,640	643,836	181,777	12,051	209,206	422,580	631,786

CAPITAL
(DATA IN MILLIONS EXCEPT WHERE *)

YEAR	ANNUAL ADD'L ASM'S REQUIRED	* AIC COST PER ASM	ANNUAL CAPITAL REQUIREMENTS AIC	GP+E	TOTAL	CUMULATIVE CAPITAL REQUIREMENTS REPLACE	GROWTH	TOTAL
1978		0.0697						
1979	31,873	0.0739	2,353	471	2,824	32	2,792	2,824
1980	19,801	0.0770	1,525	305	1,830	379	4,274	4,654
1981	18,751	0.0793	1,487	297	1,785	435	6,003	6,439
1982	44,122	0.0849	3,745	749	4,494	1,308	9,674	10,982
1983	48,042	0.0908	4,363	873	5,236	2,459	13,709	16,168
1984	53,504	0.0972	5,199	1,040	6,239	4,019	18,388	22,407
1985	66,613	0.1040	6,926	1,385	8,311	6,783	23,936	30,719
1986	92,276	0.1113	10,266	2,053	12,319	12,335	30,703	43,038
1987	86,491	0.1190	10,296	2,059	12,355	17,420	37,974	55,393
1988	95,875	0.1274	12,212	2,442	14,655	23,732	46,316	70,048
1989	74,437	0.1363	10,145	2,029	12,174	27,227	54,996	82,222

FREIGHTER AIRCRAFT CAPITAL REQUIREMENTS
CAPACITY
(DATA IN MILLIONS EXCEPT WHERE *)

YEAR	RTM'S	* LOAD FACTOR	ATM'S REQUIRED	CURRENT FLEET ATM'S	ADDITIONAL ATM'S REQUIRED REPLACE	GROWTH	TOTAL	UTILIZATION ADJUSTMENT ADJ. CURRENT FLEET ATM'S	ATM GAIN	ADJ. ADDITIONAL ATM'S REQUIRED REPLACE	GROWTH	TOTAL
1978	3,909	65.0	6,014	6,117				6,117				
1979	4,261	65.0	6,555	6,117		438	438	6,148	31		408	408
1980	4,644	65.0	7,145	6,117		1,028	1,028	6,270	153		875	875
1981	5,062	65.0	7,788	5,754	363	1,671	2,034	6,042	288	312	1,435	1,746
1982	5,518	65.0	8,489	4,896	1,221	2,372	3,593	5,141	245	1,138	2,210	3,348
1983	6,014	65.0	9,253	4,673	1,444	3,136	4,580	4,907	234	1,370	2,976	4,346
1984	6,556	65.0	10,086	4,422	1,695	3,969	5,664	4,643	221	1,629	3,814	5,443
1985	7,146	65.0	10,994	4,086	2,031	4,877	6,908	4,290	204	1,971	4,732	6,703
1986	7,789	65.0	11,983	3,696	2,421	5,866	8,287	3,881	185	2,367	5,735	8,102
1987	8,490	65.0	13,061	3,660	2,457	6,944	9,401	3,843	183	2,409	6,809	9,218
1988	9,254	65.0	14,237	3,499	2,618	8,120	10,738	3,674	175	2,575	7,988	10,563
1989	10,087	65.0	15,518	3,853	3,764	9,401	13,165	3,996	143	3,277	9,795	13,073

CAPITAL
(DATA IN MILLIONS EXCEPT WHERE *)

YEAR	ANNUAL ADD'L ATM'S REQUIRED	* AIC COST PER ATM	ANNUAL CAPITAL REQUIREMENTS AIC	GP+E	TOTAL	CUMULATIVE CAPITAL REQUIREMENTS REPLACE	GROWTH	TOTAL
1978		0.3179						
1979	408	0.3331	136	27	163		163	163
1980	468	0.3493	163	33	196		359	359
1981	871	0.3642	317	63	381	137	608	746
1982	1,602	0.3896	624	125	749	506	983	1,489
1983	998	0.4169	416	83	499	627	1,361	1,988
1984	1,096	0.4461	489	98	587	771	1,864	2,635
1985	1,261	0.4773	602	120	722	959	2,378	3,337
1986	1,399	0.5107	714	143	857	1,224	2,941	4,164
1987	1,116	0.5465	610	122	732	1,277	3,639	4,886
1988	1,345	0.5847	786	157	943	1,431	4,408	5,830
1989	1,360	0.6257	1,226	245	1,471	1,889	5,490	7,301

Financing Requirements Data and Description

Computer print-outs of analyses to determine financing requirements, debt structure and flow of funds resulting from two levels of profitability—13 per cent and 15 per cent ROI are reproduced on Pages viii and ix, preceded by complete descriptions of the Column Headings.

The examples shown are based on the following assumptions:

Loan Period	11 years
Interest Rate	10%
Dividend Rate	25% of Net Income
Working Capital	1978 level increased at 12% per year

Description

DEBT SUMMARY

COLUMN NAME	DESCRIPTION
YEAR	Year of Forecast
ANNUAL:	
NEW DEBT	CAPITAL ADDITIONS less NET INTERNAL FUNDS up to the maximum DEBT/EQUITY RATIO assumption; Additional requirements are provided by NEW EQUITY.
AMORT NEW DEBT	Annual amount of amortization of debt shown in the NEW DEBT column. Amortization is made over the assumed loan period.
AMORT OLD DEBT	Annual amount of amortization of debt outstanding in base year (1978). Amortization is made over the assumed loan period.
OUTSTD DEBT BAL	Previous year's OUTSTD DEBT BAL plus NEW DEBT minus AMORT NEW DEBT and AMORT OLD DEBT.
INTEREST	Annual interest at the assumed interest rate as applied to previous year's OUTSTD DEBT BAL
CUMULATIVE:	Cumulative values for NEW DEBT, AMORT NEW DEBT, AMORT OLD DEBT and INTEREST.

DEBT AND EQUITY

COLUMN NAME	DESCRIPTION
YEAR	Year of Forecast
DEBT:	
DEBT PAYMENT	Sum of AMORT NEW DEBT and AMORT OLD DEBT.
NEW DEBT	Previously described.
DEBT OUTSTANDING	Same as OUTSTD DEBT BAL (previously described).
EQUITY:	
NET INCOME	Earnings after taxes.
DIVIDENDS	Return to Stockholders at an assumed rate.
NEW EQUITY	Sale of stock.
STOCKHOLDER EQUITY	Previous year's STOCKHOLDER EQUITY plus NET INCOME and NEW EQUITY, less DIVIDENDS.
DEBT & EQUITY	Sum of DEBT OUTSTANDING and STOCKHOLDER EQUITY .
DEBT RATIO	DEBT OUTSTANDING divided by DEBT OUTSTANDING plus STOCKHOLDER EQUITY.

CAPITAL REQUIREMENTS AND FUNDS

COLUMN NAME	DESCRIPTION
YEAR	Year of Forecast
ANNUAL:	
NET AVAILABLE INTERNAL FUNDS	NET INCOME plus DEPRECIATION less DEBT PAYMENT and DIVIDENDS.
CAPITAL ADDITIONS	Annual cost of aircraft, spare engines, spare parts and associated ground property and equipment..
CUMULATIVE:	Cumulative values for NET AVAILABLE INTERNAL FUNDS and CAPITAL ADDITIONS.
FINANCING:	Sources of funds used to provide for capital additions.

WORKING CAPITAL

COLUMN NAME	DESCRIPTION
YEAR	Year of Forecast
ANNUAL:	
SOURCES:	
NET INCOME	Previously described.
DEPREC	Annual straight line depreciation for assumed depreciation period.
NEW DEBT	Previously described.
NEW EQUITY	Previously described.
APPLICATIONS:	
CAPITAL ADDITIONS	Previously described.
DEBT PAYMENT	Previously described.
DIVIDENDS	Previously described.
CHANGE IN WORKING CAPITAL	SOURCES less APPLICATION.
WORKING CAPITAL	Previous year's WORKING CAPITAL plus CHANGE IN WORKING CAPITAL. WORKING CAPITAL for base year 1978 is Current Assets less Current Liabilities with Current Maturities of Long-Term Debt and Current Obligations Under Capital Leases excluded from Current Liabilities.
CUMULATIVE:	Cumulative values for items listed above , except WORKING CAPITAL is cumulative CHANGE IN WORKING CAPITAL.

Data

DEBT SUMMARY
AT 13.0 PCT ROI
($000)

	ANNUAL					CUMULATIVE			
YEAR	NEW DEBT	AMORT NEW DEBT	AMORT OLD DEBT	OUTSTD DEBT BAL	INTEREST	NEW DEBT	AMORT NEW DEBT	AMORT OLD DEBT	INTEREST
1979	1,012,118	0	687,618	7,888,295	605,104	1,012,118	0	687,618	605,104
1980	150,621	92,011	687,618	7,259,287	709,947	1,162,738	92,011	1,375,235	1,315,050
1981	336,714	105,703	687,618	6,802,680	725,929	1,499,453	197,714	2,062,853	2,040,979
1982	2,958,713	136,314	687,618	8,937,461	680,268	4,458,165	334,028	2,750,471	2,721,247
1983	3,229,632	405,288	687,618	11,074,188	893,746	7,687,797	739,316	3,438,089	3,614,993
1984	4,028,201	698,891	687,618	13,715,880	1,107,419	11,715,998	1,438,206	4,125,706	4,722,412
1985	5,753,443	1,065,091	687,618	17,716,615	1,371,588	17,469,441	2,503,297	4,813,324	6,094,000
1986	8,937,024	1,588,131	687,618	24,377,890	1,771,661	26,406,465	4,091,428	5,500,942	7,865,661
1987	8,551,131	2,400,588	687,618	29,840,815	2,437,789	34,957,596	6,492,016	6,188,560	10,303,450
1988	10,291,606	3,177,963	687,618	36,266,841	2,984,082	45,249,202	9,669,979	6,876,177	13,287,532
1989	8,224,305	4,113,564	687,618	39,689,964	3,626,684	53,473,507	13,783,543	7,563,795	16,914,216

DEBT AND EQUITY
($000)

	DEBT			EQUITY					
YEAR	DEBT PAYMENT	NEW DEBT	DEBT OUTSTANDING	NET INCOME	DIVIDENDS	NEW EQUITY	STOCKHOLDER EQUITY	DEBT + EQUITY	DEBT RATIO
1979	687,618	1,012,118	7,888,295	1,455,474	363,869	0	7,962,306	15,850,601	49.8
1980	779,628	150,621	7,259,287	1,405,940	351,485	0	9,016,761	16,276,048	44.6
1981	793,321	336,714	6,802,680	1,474,347	368,587	0	10,122,521	16,925,201	40.2
1982	823,932	2,958,713	8,937,461	1,991,723	497,931	0	11,616,313	20,553,775	43.5
1983	1,092,905	3,229,632	11,074,188	2,278,137	569,534	0	13,324,916	24,399,104	45.4
1984	1,386,508	4,028,201	13,715,880	2,668,016	667,004	0	15,325,929	29,041,809	47.2
1985	1,752,708	5,753,443	17,716,615	3,239,826	809,956	0	17,755,798	35,472,412	49.9
1986	2,275,749	8,937,024	24,377,890	4,106,059	1,026,515	0	20,835,342	45,213,231	53.9
1987	3,088,205	8,551,131	29,840,815	4,598,461	1,149,615	0	24,284,188	54,125,003	55.1
1988	3,865,581	10,291,606	36,266,841	5,415,570	1,353,893	0	28,345,865	64,612,706	56.1
1989	4,801,182	8,224,305	39,689,964	5,781,688	1,445,422	0	32,682,132	72,372,096	54.8

CAPITAL REQUIREMENTS AND FUNDS
($000)

	ANNUAL		CUMULATIVE		
YEAR	NET AVAILABLE INTERNAL FUNDS	CAPITAL ADDITIONS	NET AVAILABLE INTERNAL FUNDS	CAPITAL ADDITIONS	FINANCING
1979	1,974,682	2,986,800	1,974,682	2,986,800	SOME EXTERNAL, ALL DEBT
1980	1,874,979	2,025,600	3,849,662	5,012,400	SOME EXTERNAL, ALL DEBT
1981	1,829,286	2,166,000	5,678,947	7,178,400	SOME EXTERNAL, ALL DEBT
1982	2,284,087	5,242,800	7,963,035	12,421,200	SOME EXTERNAL, ALL DEBT
1983	2,505,168	5,734,800	10,468,203	18,156,000	SOME EXTERNAL, ALL DEBT
1984	2,797,399	6,825,600	13,265,602	24,981,600	SOME EXTERNAL, ALL DEBT
1985	3,280,157	9,033,600	16,545,759	34,015,200	SOME EXTERNAL, ALL DEBT
1986	4,240,176	13,177,200	20,785,935	47,192,400	SOME EXTERNAL, ALL DEBT
1987	4,536,069	13,087,200	25,322,004	60,279,600	SOME EXTERNAL, ALL DEBT
1988	5,305,994	15,597,600	30,627,998	75,877,200	SOME EXTERNAL, ALL DEBT
1989	5,420,895	13,645,200	36,048,893	89,522,400	SOME EXTERNAL, ALL DEBT

WORKING CAPITAL
($000)

	ANNUAL									
	SOURCES				APPLICATIONS			CHANGE IN	
YEAR	NET INCOME	DEPREC	NEW DEBT	NEW EQUITY	CAPITAL ADDITIONS	DEBT PAYMENT	DIVIDENDS	WORKING CAPITAL	WORKING CAPITAL
1979	1,455,474	1,682,585	1,012,118	0	2,986,800	687,618	363,869	111,890	1,044,310
1980	1,405,940	1,725,470	150,621	0	2,025,600	779,628	351,485	125,317	1,169,628
1981	1,474,347	1,657,202	336,714	0	2,166,000	793,321	368,587	140,355	1,309,983
1982	1,991,723	1,771,425	2,958,713	0	5,242,800	823,932	497,931	157,198	1,467,181
1983	2,278,137	2,065,532	3,229,632	0	5,734,800	1,092,905	569,534	176,062	1,643,243
1984	2,668,016	2,380,084	4,028,201	0	6,825,600	1,386,508	667,004	197,189	1,840,432
1985	3,239,826	2,823,848	5,753,443	0	9,033,600	1,752,708	809,956	220,852	2,061,284
1986	4,106,059	3,683,735	8,937,024	0	13,177,200	2,275,749	1,026,515	247,354	2,308,638
1987	4,598,461	4,452,465	8,551,131	0	13,087,200	3,088,205	1,149,615	277,037	2,585,674
1988	5,415,570	5,420,178	10,291,606	0	15,597,600	3,865,581	1,353,893	310,281	2,895,955
1989	5,781,688	6,233,325	8,224,305	0	13,645,200	4,801,182	1,445,422	347,515	3,243,470

CUMULATIVE

	SOURCES				APPLICATIONS			
YEAR	NET INCOME	DEPREC	NEW DEBT	NEW EQUITY	CAPITAL ADDITIONS	DEBT PAYMENT	DIVIDENDS	WORKING CAPITAL
1979	1,455,474	1,682,585	1,012,118	0	2,986,800	687,618	363,869	111,890
1980	2,861,414	3,408,055	1,162,738	0	5,012,400	1,467,246	715,354	237,208
1981	4,335,762	5,065,257	1,499,453	0	7,178,400	2,260,567	1,083,940	377,563
1982	6,327,484	6,836,681	4,458,165	0	12,421,200	3,084,499	1,581,871	534,761
1983	8,605,622	8,902,214	7,687,797	0	18,156,000	4,177,404	2,151,405	710,823
1984	11,273,638	11,282,298	11,715,998	0	24,981,600	5,563,913	2,818,410	908,012
1985	14,513,464	14,106,146	17,469,441	0	34,015,200	7,316,621	3,628,366	1,128,864
1986	18,619,522	17,789,881	26,406,465	0	47,192,400	9,592,370	4,654,881	1,376,218
1987	23,217,984	22,242,346	34,957,596	0	60,279,600	12,680,575	5,804,496	1,653,254
1988	28,633,554	27,662,524	45,249,202	0	75,877,200	16,546,156	7,158,388	1,963,535
1989	34,415,242	33,895,849	53,473,507	0	89,522,400	21,347,338	8,603,811	2,311,050

MINIMUM WORKING CAPITAL IN BASE YEAR 1978 = 932420
INCREASED AT 12 PCT PER YEAR
DIVIDENDS AT 25 PCT OF NET INCOME

Data

DEBT SUMMARY
AT 15.0 PCT ROI
($000)

	ANNUAL					CUMULATIVE			
YEAR	NEW DEBT	AMORT NEW DEBT	AMORT OLD DEBT	OUTSTD DEBT BAL	INTEREST	NEW DEBT	AMORT NEW DEBT	AMORT OLD DEBT	INTEREST
1979	774,359	0	687,618	7,650,536	605,104	774,359	0	687,618	605,104
1980	0	201,579	687,618	6,761,339	688,548	774,359	201,579	1,375,235	1,293,652
1981	10,183	70,396	687,618	6,013,508	676,134	784,541	271,976	2,062,853	1,969,786
1982	2,526,226	71,322	687,618	7,780,794	601,351	3,310,768	343,297	2,750,471	2,571,136
1983	2,672,586	300,979	687,618	9,464,784	778,079	5,983,354	644,276	3,438,089	3,349,216
1984	3,316,919	543,941	687,618	11,550,144	946,478	9,300,273	1,188,218	4,125,706	4,295,694
1985	4,839,315	845,479	687,618	14,856,362	1,155,014	14,139,588	2,033,697	4,813,324	5,450,709
1986	7,741,592	1,285,417	687,618	20,624,920	1,485,636	21,881,180	3,319,114	5,500,942	6,936,345
1987	7,046,394	1,989,198	687,618	24,994,497	2,062,492	28,927,574	5,308,312	6,188,560	8,998,837
1988	8,410,758	2,629,779	687,618	30,087,858	2,499,450	37,338,332	7,938,092	6,876,177	11,498,287
1989	5,956,130	3,394,394	687,618	31,961,977	3,008,786	43,294,462	11,332,486	7,563,795	14,507,072

DEBT AND EQUITY
($000)

	DEBT			EQUITY				
YEAR	DEBT PAYMENT	NEW DEBT	DEBT OUTSTANDING	NET INCOME	DIVIDENDS	NEW EQUITY	STOCKHOLDER EQUITY	DEBT + EQUITY	DEBT RATIO
1979	687,618	774,359	7,650,536	1,772,486	443,122	0	8,200,065	15,850,601	48.3
1980	889,197	0	6,761,339	1,752,859	438,215	0	9,514,709	16,276,048	41.5
1981	758,014	10,183	6,013,508	1,862,646	465,662	0	10,911,694	16,925,201	35.5
1982	758,940	2,526,226	7,780,794	2,481,715	620,429	0	12,772,980	20,553,775	37.9
1983	988,597	2,672,586	9,464,784	2,881,786	720,447	0	14,934,320	24,399,104	38.8
1984	1,231,559	3,316,919	11,550,144	3,409,793	852,448	0	17,491,665	29,041,809	39.8
1985	1,533,097	4,839,315	14,856,362	4,165,847	1,041,462	0	20,616,050	35,472,412	41.9
1986	1,973,035	7,741,592	20,624,920	5,296,348	1,324,087	0	24,588,312	45,213,231	45.6
1987	2,676,816	7,046,394	24,994,497	6,056,258	1,514,065	0	29,130,506	54,125,003	46.2
1988	3,317,397	8,410,758	30,087,858	7,192,456	1,798,114	0	34,524,848	64,612,706	46.6
1989	4,082,012	5,956,130	31,961,977	7,847,029	1,961,757	0	40,410,119	72,372,096	44.2

CAPITAL REQUIREMENTS AND FUNDS
($000)

	ANNUAL		CUMULATIVE		
YEAR	NET AVAILABLE INTERNAL FUNDS	CAPITAL ADDITIONS	NET AVAILABLE INTERNAL FUNDS	CAPITAL ADDITIONS	FINANCING
1979	2,212,441	2,986,800	2,212,441	2,986,800	SOME EXTERNAL, ALL DEBT
1980	2,025,600	2,025,600	4,238,041	5,012,400	INTERNAL FUNDS, REDUCE OLD DEBT
1981	2,155,817	2,166,000	6,393,859	7,178,400	SOME EXTERNAL, ALL DEBT
1982	2,716,574	5,242,800	9,110,432	12,421,200	SOME EXTERNAL, ALL DEBT
1983	3,062,214	5,734,800	12,172,646	18,156,000	SOME EXTERNAL, ALL DEBT
1984	3,508,681	6,825,600	15,681,327	24,981,600	SOME EXTERNAL, ALL DEBT
1985	4,194,285	9,033,600	19,875,612	34,015,200	SOME EXTERNAL, ALL DEBT
1986	5,435,608	13,177,200	25,311,220	47,192,400	SOME EXTERNAL, ALL DEBT
1987	6,040,806	13,087,200	31,352,026	60,279,600	SOME EXTERNAL, ALL DEBT
1988	7,186,842	15,597,600	38,538,868	75,877,200	SOME EXTERNAL, ALL DEBT
1989	7,689,070	13,645,200	46,227,938	89,522,400	SOME EXTERNAL, ALL DEBT

WORKING CAPITAL
($000)

	ANNUAL								
	SOURCES				APPLICATIONS			CHANGE IN	
YEAR	NET INCOME	DEPREC	NEW DEBT	NEW EQUITY	CAPITAL ADDITIONS	DEBT PAYMENT	DIVIDENDS	WORKING CAPITAL	WORKING CAPITAL
1979	1,772,486	1,682,585	774,359	0	2,986,800	687,618	443,122	111,890	1,044,310
1980	1,752,859	1,725,470	0	0	2,025,600	889,197	438,215	125,317	1,169,628
1981	1,862,646	1,657,202	10,183	0	2,166,000	758,014	465,662	140,355	1,309,983
1982	2,481,715	1,771,425	2,526,226	0	5,242,800	758,940	620,429	157,198	1,467,181
1983	2,881,786	2,065,532	2,672,586	0	5,734,800	988,597	720,447	176,062	1,643,243
1984	3,409,793	2,380,084	3,316,919	0	6,825,600	1,231,559	852,448	197,189	1,840,432
1985	4,165,847	2,823,848	4,839,315	0	9,033,600	1,533,097	1,041,462	220,852	2,061,284
1986	5,296,348	3,683,735	7,741,592	0	13,177,200	1,973,035	1,324,087	247,354	2,308,638
1987	6,056,258	4,452,465	7,046,394	0	13,087,200	2,676,816	1,514,065	277,037	2,585,674
1988	7,192,456	5,420,178	8,410,758	0	15,597,600	3,317,397	1,798,114	310,281	2,895,955
1989	7,847,029	6,233,325	5,956,130	0	13,645,200	4,082,012	1,961,757	347,515	3,243,470

	CUMULATIVE							
	SOURCES				APPLICATIONS			
YEAR	NET INCOME	DEPREC	NEW DEBT	NSW EQUITY	CAPITAL ADDITIONS	DEBT PAYMENT	DIVIDENDS	WORKING CAPITAL
1979	1,772,486	1,682,585	774,359	0	2,986,800	687,618	443,122	111,890
1980	3,525,345	3,408,055	774,359	0	5,012,400	1,576,815	881,336	237,208
1981	5,387,992	5,065,257	784,541	0	7,178,400	2,334,829	1,346,998	377,563
1982	7,869,707	6,836,681	3,310,768	0	12,421,200	3,093,768	1,967,427	534,761
1983	10,751,493	8,902,214	5,983,354	0	18,156,000	4,082,365	2,687,873	710,823
1984	14,161,286	11,282,298	9,300,273	0	24,981,600	5,313,924	3,540,322	908,012
1985	18,327,134	14,106,146	14,139,588	0	34,015,200	6,847,021	4,581,783	1,128,864
1986	23,623,482	17,789,881	21,881,180	0	47,192,400	8,820,056	5,905,871	1,376,218
1987	29,679,741	22,242,346	28,927,574	0	60,279,600	11,496,872	7,419,935	1,653,254
1988	36,872,197	27,662,524	37,338,332	0	75,877,200	14,814,269	9,218,049	1,963,535
1989	44,719,225	33,895,849	43,294,462	0	89,522,400	18,896,281	11,179,806	2,311,050

MINIMUM WORKING CAPITAL IN BASE YEAR 1978 = 932420
INCREASED AT 12 PCT PER YEAR
DIVIDENDS AT 25 PCT OF NET INCOME

Comparison of 1976 and Current Study

In 1976 capital requirements of the 1980's were estimated by the ATA at $60 billion for passenger aircraft and associated equipment. The estimated capital requirements for the same time period in this study are $87 billion. An additional $3 billion of equipment scheduled for delivery in 1979 brings the total capital investment required for the period 1979 through 1989 to $90 billion.

Figure 13 summarizes the elements which make up the difference between these two estimates.

The 1976 study incorporated conservative assumptions with regard to aircraft service life, traffic growth rate, load factor, and aircraft cost inflation. In the intervening three years since the study was made, conditions have differed widely from some of those conservative assumptions. For example, traffic growth rates, assumed in the study at 6 per cent per year have averaged 11 per cent over the last three years. Aircraft cost inflation, assumed at 6 per cent, has averaged over 7 per cent during the last three years. The divergence between the actual conditions and the assumed conditions for those years account for $11 billion difference in the capital requirements.

While the 1976 study addressed itself only to passenger aircraft equipment requirements, the new study includes the requirements for freighter aircraft to serve the rapidly growing air cargo business. This adds another $7 billion to the industry requirements. In addition, due to the distinct structural changes in the industry, it was necessary to revise the assumptions affecting future capital requirements. While some of these new assumptions tended to increase the requirements, others such as a higher utilization rate for aircraft, tended to decrease future requirements. The net effect of the changes in assumptions is to increase the capital requirements in the period 1980 to 1989 by $9 billion.

Thus, the current estimate of capital requirements in the 1980 decade is $87 billion. The addition of the $3 billion for equipment already on order for delivery in 1979 brings the total requirement for the period 1979 to 1989 to $90 billion.

COMPARISON OF THE 1976 STUDY & THE CURRENT STUDY CAPITAL REQUIREMENTS U.S. SCHEDULED AIRLINES

1976 Study[1] (1980-1989)	$60 Billion
Change due to actual vs. assumed conditions between base years 1975 and 1978	11
Freighter requirements not considered in 1976 study	7
Net effect of new assumptions	9
Current Study: 1980-1989	87
1979	3
1979-1989	$90 Billion

[1]The Sixty Billion Dollar Question

FIGURE 13

Corporate ROI vs. CAB Ratemaking ROI

The return on investment measure used in this study is the corporate return on investment (ROI), and is defined as:

$$\frac{\text{Net Income + Interest on Long Term Debt}}{\text{Long Term Debt + Stockholder's Equity}}$$

This differs from the ROI used as a measure of profitability in the 1976 study. Until the passage of the Airline Deregulation Act in October of 1978, the Civil Aeronautics Board incorporated in its ratemaking procedures a unique form of ROI. This form of ROI computed net income as that which would have been achieved had the airlines paid the corporate income tax rate of 48 per cent. Other adjustments were made to the ROI when finally used for ratemaking purposes. However, the unadjusted value which included only the corporate income tax rate assumption was used for defining levels of profitability in the 1976 study. As shown in Figure 14, corporate ROI levels as used in this study will normally be significantly above the unadjusted ratemaking ROI used in the 1976 study. We have chosen to use the corporate ROI in this study since it is the generally accepted measure of return on investment by other U.S. industries. In addition, the CAB ratemaking ROI no longer has any significance since the passage of the Airline Deregulation Act.

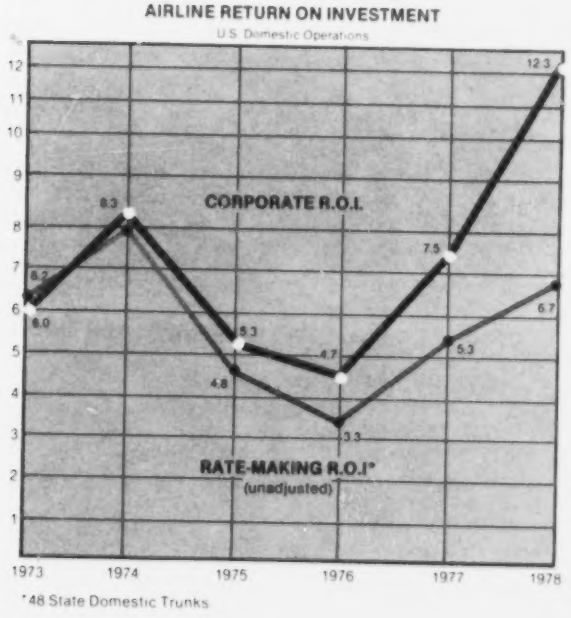


FIGURE 14